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ABSTRACT

The effects of presenting test items in random order or in a sequence parallel to the order of presentation were studied by testing 92 undergraduates in an introductory psychology course at Emporia State University (Kansas). Two test forms, sequential (S) and random (R), of multiple-choice questions were prepared for four 1-hour examinations administered to three sections of classes using the same text. The students were randomly assigned to receive the four examinations according to the following orders: SRRS, SSRR, SRSR, RRSS, RSSR, and RSRS. A two-factor, split-plot analysis of variance was used to analyze the scores obtained. There was no instance in which a sequential test resulted in a higher score than a random test. It appears that instructors can use the random-order option offered by current test bank software with confidence that this will not have a negative impact on student performance. (SLD)

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Scrambled Order - Scrambled Brains: The Effects Of Presenting Test Items In Sequential Versus Random Order

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While students and faculty alike will readily agree that studying and classroom lectures involve the serial presentation of material, it is not at all clear that this fact has been considered to be especially relevant in the construction of examinations. However, the results of memory studies (e.g., Cohen, 1966; Tulving, 1962) prompt the tentative conclusion that when questions parallel the order of presentation retention is superior.

On the other hand, the studies of test-item sequence that have been reported (e.g., Dambrot, 1980; Schmitt & Scheirer, 1977; Spiers & Pihl, 1976) have failed to support this predicted relationship. The most frequent effect reported by these studies has been no effect at all. Unfortunately, these earlier studies failed to fully specify exactly how the non-sequential ordering was derived. With the popularization of computer-generated tests the ability to create randomly ordered examinations is no more difficult than making one key stroke on the computer. Hence, the need for additional data comparing performance under sequential versus the computer-generated random pattern is quite relevant. The present study was designed to address this

issue.

Method

Subjects

Ninety-two undergraduate college students enrolled in three sections of Introduction to Psychology at Emporia State University served as subjects. These classes were taught by two instructors. The same text, Psychology by Benjamin, Hopkins, and Nation (Macmillan Publishing Co.) was used by all students.

Testing Instruments

Four one-hour exams administered in each class during the course of the semester were selected for experimental manipulation. In all cases only multiple choice questions were subjected to analysis.

Two test forms, sequential (S) and random (R), comprised of the same questions were prepared for each exam. The sequential form coincided with the order of presentation found in the text. The random forms were generated through the use of the software supplied by the publisher and an Apple IIe microcomputer.

Procedure

Within each class, the subjects were randomly assigned to receive the four exams according to one of the following six orders: SRRS, SSRR, SRSR, RRSS, RSSR, and RSRS. This procedure allowed for an evaluation of

any carry over effects that might be present. On each testing occasion the specified form of the test was placed face down on each student's desk. All students were instructed to begin the test at the same time.

Results and Discussion

A two-factor, split-plot analysis of variance was employed to analyze the scores from the four exams. Order (6 levels) served as the between-subjects factor, while Tests (4 levels) was the within-subjects factor. The results of this analysis yielded significance for the Tests, $F(3, 258) = 7.884$, $p < .001$, and Order x Tests, $F(15, 258) = 1.846$, $p = .029$, effects. As inspection of the significant interaction through the use of the Newman-Keuls procedure failed to reveal any instance in which a sequential test resulted in a higher score than a random test, it can be concluded that this factor is negligible, at best.

In failing to find differential effects of sequential versus random presentation of multiple choice items, the present data are supportive of previous studies (e.g., Dambrot, 1980; Schmitt & Scheirer, 1977; Spiers & Pihl, 1976). Hence, instructors can employ the random-order option offered by current test-bank software with confidence that this action will not have a negative impact upon student performance. In fact, as

randomization has frequently been used to deter academic dishonesty (cheating), the present data should encourage instructors to continue using this technique.

References

Cohen, B. H. (1966). Some or none characteristics of coding behavior. Journal of Verbal Learning and Verbal Behavior, 5, 182-187.

Dambrot, F. (1980). Test item order and academic ability, or should you shuffle the test item deck? Teaching of Psychology, 7, 94-96.

Schmitt, J. C., & Scheirer, C. J. (1977). The effect of item order on objective tests. Teaching of Psychology, 4, 144-145.

Spiers, P. A., & Pihl, R. O. (1976). The effect of study habits, personality and order of presentation on success in an open-book objective examination. Teaching of Psychology, 3, 33-34.

Tulving, E. (1962). The effect of alphabetical subjective organization on memorizing unrelated words. Canadian Journal of Psychology, 16, 185-191.